



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/772,157

02/03/2004

Steven J. Visco

PLUSP036

1887

22434

7590

12/30/2008

Weaver Austin Villeneuve & Sampson LLP

P.O. BOX 70250

OAKLAND, CA 94612-0250

EXAMINER

WILLS, MONIQUE M

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

12/30/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/772,157	Applicant(s) VISCO ET AL.	
	Examiner Monique M. Wills	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 and 51-66 is/are pending in the application.
- 4a) Of the above claim(s) 4-7, 13, 14, 22, 24-43, 46 and 47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 9-12, 15-21, 23, 44, 45 and 48-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This Office Action is responsive to the Amendment filed October 14, 2008.

However, the instant claims are rejected as follows:

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 13, 9-12, 15-21, 23, 44-45, 48-63, rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant includes a "first material" and "second material" in claim 1. The "second material" may be ANY ceramic active metal ion conductors and glass-ceramic active metal ions conductors, included those that are not defined in the specification. In other words, the specification lists specific second materials but does not provide support for materials not in Applicant's disclosure.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1, 3, 44, 49, 50, 51-53 & 56-57 are a are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of copending Application No. 10/825,587 1-3, 5, 7-14, 19 and 23. Although the conflicting claims are not identical, they are not patentably distinct from each other.

Copending Application No. 10/825,587 claims an electrochemical cell comprising: a renewable active metal anode; a cathode structure comprising a electronically conductive component, an ionically conductive component, and a fluid oxidant; an ionically conductive protective membrane on the first surface of the anode, the membrane comprising, one or more materials configured to provide a first surface

Art Unit: 1795

chemically compatible with the active metal of the anode in contact with the anode, and a second surface substantially impervious to and chemically compatible with the cathode structure and in contact with the cathode structure (Claim 1 as applied to instant claim 1).

The cathode structure employs water which is the active component (claim 1 and 5 as applied to claims 3). The anode material is lithium (claims 1, 9 and 14 as applied to claim 44).

The protective membrane is a composite comprising first and second materials having identical compositions (claim 2 as applied to claim 50) and the membrane has the same requisite ionic conductivity (claim 3 as applied to claim 49).

The membrane is a laminate (claim 7 as applied to claim 51) and has a graded composition (claim 8 as applied to claim 52).

The first component is a composite reaction product of active metal with Cu_3N , active metal halides, active metal phosphides and active metal halides and active metal phosphorous oxynitrides (claim 10 as applied to claim 53) or a composite reaction product of active material with Cu_3N , Li_3N , Li_3P , and LiI , LiBr , LiCl , LiF and LiPON (claim 11 as applied to claim 55).

The second composite comprises a material selected the group consisting of glassy or amorphous metal ion conductors, ceramic active metal ion conductors, and glass-ceramic active metal ion conductors (claim 12 as applied to claim 56) and has the same composition as that of claim 57 (see claim 13).

Art Unit: 1795

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

3. Claims 1, 3, 9, 44 & 21, 50, 53 & 55 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 55-081471 A (JP '471).

JP '471 discloses a lithium/air cell comprising a lithium anode 4, a porous cathode 2 and a solid electrolyte 5 disposed between the cathode and anode (abstract and Fig. 1 as applied to generic claim 1).

Li₃N is the same type of material disclosed in the instant application for one of the layers and thus is held to exhibit the same requisite ionic conductivity required in claim 3.

The anode is solid-state lithium (as applied to claims 9 and 14).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

Art Unit: 1795

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 as applied to claim 1 above, and further in view of U.S. Patent No. 5,314,765 (Bates).

The first material is Li₃N which is an identical material to those claimed active metal nitrides and thus broadly reads on the Markush groups of claims 10 and 11).

The teachings of claim 1 have been discussed above and are incorporated herein.

JP '471 does not appear to expressly disclose of the conductive protective membrane being a that the membrane is a laminate (claim 50)

Bates teaches of providing a multilaminate composition comprising a first layer of Li₃N and a top layer of LiPON thereon (Fig. and col. 2, ll. 50-65).

The addition of a top layer of LiPON to the system of JP '471 would have improved the life of operation of the cell of JP '471 by protecting the reactive anode from other components in the system.

5. Claims 2, 8, 11 & 12, 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 as applied to claim 1 above, and further in view of U.S. Patent No. 3976509 (Tsai).

JP '471 teaches an electrochemical cell as described hereinabove.

JP '471 does not appear to expressly disclose water as the cathode fluid oxidant.

While JP '471 discloses using air for the cathode fluid oxidant, use of other oxidant sources such as water in lithium electrochemical cells has been well established in the art as taught by Tsai (abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '471 by using any number of cathode fluid oxidants including water since such materials have been established cathode fluids in the art as taught by Tsai and since it has been established that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

6. Claims 48- 49, 50, 54 & 56-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 in view of Bates as applied to claim 12 above, and further in view of U.S. Patent No. 6,485,622 (Fu).

Art Unit: 1795

The difference not yet discussed is of the particular material of claim 50 for the second component. The reference is also silent to the cell configurations (58-63).

Fu teaches that the same lithium ion conductive glass-ceramic material is known in the art for use in lithium electrochemical cells (abstract as applied to claims 20 and 28). These materials include ionic conductivities of 10^{-4} S/cm (Table 2), 10^{-4} S/cm being held to be "about" 10^{-3} S/cm (as applied to claim 7). The composition has an increased ionic conductivity as well as enhanced thermal stability within electrochemical devices.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '471 in view of Bates by selecting the second material to be the lithium ion conductive glass-ceramic material taught by Fu since it would have provided a material which provided both protection to the anode as well as increased the ionic conductivity of the protection composite in the cell. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

With respect to claims 58-63, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ a planar configuration or tubular configuration or capillary construction, because change in the shape of a component is prima facie obvious. Further, it is well known to employ lithium, primary or rechargeable batteries. The selection of a known material based on its suitability for its

Art Unit: 1795

intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945)

7. Claim 10, 15-20, & 23, 52 & 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 in view of *McRae et al.* U.S. Pat. 3,607,417.

JP'471 does not expressly disclose a liquid electrolyte of aqueous solutions, the cathode on an electronically conductive porous catalytic support, wherein the support is nickel or the cell has an open cell voltage of at least 2 V.

McRae teaches a battery cell having a lithium metal anode 22, a nonaqueous electrolyte 23 adjacent the anode 22 (active material ion conducting separator layer), a cathode structure 26/27 and a cation permeable/water impermeable membrane 25 (impervious ionically conductive layer) adjacent the cathode structure 26/27. The nonaqueous electrolyte 23 may be, for example, dimethyl formamide or ethylene carbonate containing lithium tetrafluoroborate, lithium hexafluorophosphate or the like (5:44-62). See Figure 3. Claim 9 recites a glass composition of 83 mol% V_2O_5 -10 mol% P_2O_5 -6.5 mol% Li_2O as the impermeable membrane 25 (impervious ionically conductive layer). The cathode structure includes $LiOH$ 26 and an air electrode 27. The air electrode may be catalytic lithiated nickel oxide supported on nickel (4:72-5:5). The chemical reaction of the battery cell are shown in column 5, lines 10-14. As shown, the cathode reaction includes water (aqueous).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the catalytic nickel support of *McRae*, in

Art Unit: 1795

the electrochemical cell of JP'471, in order to improve structural integrity of the catalytic and electrode layers.

With respect to the employment of liquid electrolyte, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the aqueous electrolyte salt/solvent of McRae, in the electrochemical cell of JP'471, in order to increase ion conductivity between electrodes. The skilled artisan recognizes that liquid electrolytes permeate porous electrodes, increasing ion conductivity between.

With respect to an open cell voltage of at least 2V, it would be reasonable to expect that the cell possesses the instant open circuit voltage because the cells contain identical materials. In accordance with MPEP 2112.01, "[p]roducts of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). In the instant case,

Response to Arguments

Applicant's arguments, with respect to the anticipation or obviousness of JP 55-081471, because the reference does not teach a battery with a glass-ceramic conductor. The newly added limitation require said material introduces new matter. When the new matter rejection is overcome the reference will be withdrawn or reapplied on new grounds.

Art Unit: 1795

With respect to the double patenting rejection, Applicant contends that Visco ,587 teaches a “renewable active material anode, configured for supplementation”. This argument is not persuasive, as the rechargability of an electrode material is obvious. The skilled artisan would be motivated to recharge the cell for economic and environmental benefit. Therefore, the rejection is maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.


If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Patrick Ryan, may be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Monique M Wills/
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795

<i>Application Number</i> 	Application/Control No.	Applicant(s)/Patent under Reexamination	
	10/772,157	VISCO ET AL.	
	Examiner	Art Unit	
	Monique M. Wills	1795	